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PREVALENCE AND CONTRIBUTING FACTORS OF ANEMIA IN PREGNANT WOMEN AT THE ANTENATAL CARE SETTING IN ADDIS ABABA

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Acronyms.

Hb	= Hemoglobin.
Hgb	= Hemoglobin.
WHO	= World Health Organization.
EDHS	= Ethiopian Demographic Health survey.
ANC	= Antenatal care.
UOG	= University of Gondar.
MPH	= Master of Public Health
ACIPH	= Addis Continental Institute of Public Heath.
NSAIDS	= Non Steroidal Anti Inflammatory Drugs.
PUD	= Peptic Ulcer disease.
OR	= Odds Ratio.
RR	= Relative Risk.
Crude OR	= Crude odds ratio.
Adjusted OR	= Adjusted odds ratio.
CI	= Confidence Interval.
FMOH	= Federal Ministry of Health.
UNICEF	= United Nations Children's Fund.

Abstract

Background: Anemia is a condition that affects 25% to 50% of the world population, and approximately 50% of the pregnant women. Many unwanted complications of pregnancy have been linked to anemia. The prevalence and the risk factors for anemia have not been well defined in Ethiopia.

Objective: The main objective of the study is to assess the prevalence and determinants of anemia among pregnant women at the antenatal care setting.

Methods: A cross-sectional study of 547 healthy pregnant women receiving antenatal care service in Addis Ababa was conducted. Questionnaires to assess the different risk factors for anemia such as Socio-demographic variables, menstruation and pregnancy related variables, diet and health related variables were employed. Results of the hemoglobin level of those selected pregnant women were taken from the antenatal card and laboratory register. Epi info soft ware was used for data entry and SPSS soft ware was used for data analysis.

Results: Anemia (Hemoglobin < 11g/dl) Was present in 77 (14.1%) of the pregnant women. From these 2.5% were severe anemic (Hemoglobin <7g/dl), 22% moderately anemic (Hemoglobin ≥7and < 9 g/dl) and 75% mild anemic (Hemoglobin≥ 9 and< 11g/dl).

Chronic disease such as TB, HIV/ AIDS were a significant risk factors for anemia OR = 4.643 95% CI (1.917-11.274) adjusted OR = 3.414 95% CI= (1.252- 9.308), p value = 0.016. Chronic kidney disease was also the other significant risk factor for anemia, OR = 3.089 95% CI = (1.527-6.250) adjusted OR = 2.860 95% CI = (1.261-6.489), p- value was found to be 0.012.

Conclusion and Recommendation

Chronic diseases such as TB, HIV/AIDS and chronic kidney disease are main factors contributing to the anemic status of pregnant women. Treating the underlying disease is necessary, because Iron supplementation tablets alone can not elevate the Hemoglobin level in anemia caused by chronic disease. Measures to improve the intake of iron rich diet especially meat should be employed and Iron supplementation during pregnancy should be continued.

1. Introduction

Anemia is a condition of too few red blood cells, or a lowered ability of red blood cells to carry oxygen or iron. Tissue enzymes dependant on iron can affect cell function in nerves and muscles. The fetus is dependant on the mothers blood and anemia can cause poor fetal growth, preterm birth and low birth weight. (1)

Two billion people-over 30% of the worlds population are anemic with about one billion suffering from iron deficiency anemia. In many developing countries one out of two pregnant women and more than one out of every three preschool children are estimated to be anemic. In countries where meat consumption is low, such as India and sub-Saharan Africa, up to 90%of women are or become anemic during pregnancy. According to the World Health Organization definition of anemia in pregnancy is defined as a hemoglobin concentration of <11.0 g/dl in the first and <10.5g/dl in the second half of pregnancy. World Health Organization further divided anemia into mild anemia Hemoglobin 10-10.9 g/dl, Moderate anemia hemoglobin 7.0 to 9.9g/dl and severe anemia Hb.<7g/dl.(2)

Anemia is a disease with multiple causes both nutritional (vitamin and mineral deficiencies) and non-nutritional (infection) that frequently co-occur. It is assumed that one of the most common contributing factors is Iron deficiency, and anemia resulting from Iron deficiency is considered to be one of the top 10 contributors of global burden of disease.(3)

In the developing countries the prevalence rates in pregnant women are commonly estimated to be in the range of 40 to 60%. In the Ethiopian demographic health Survey 2005, the prevalence of anemia among women of age 15-49 was twenty seven percent with seventeen percent mildly anemic, 8 percent moderately anemic and one percent severely anemic. Lack of education, being pregnant and living in poor household were the main factors associated with increased prevalence of anemia. One study done in nine administration region in Ethiopia in 2005 to determine Iron deficiency anemia among women of reproductive age revealed similar results of anemia: 30.4 persent had anemia, from these Iron deficiency anemia was 49.7 percent. This study further divides anemia by severity to mild anemia of 19.3% moderate anemia 10.3 percent and severe anemia of 0.9 percent.

The magnitude of anemia and etiologies of anemia are not well established in Ethiopians. Data on the prevalence of anemia in pregnancy and determining factors

are limited. Identifying the different contributing factors for anemia in pregnancy in the different proportions to the magnitude of the problem will enable us to take public health measures to tackle anemia in pregnancy.

2. Literature Review.

Anemia is a widespread public health problem associated with increased risk of morbidity and mortality especially in pregnant women and young children. Anemia in pregnancy is associated with the increased risk of hemorrhage, puerperal infection, thrombo-embolic problems, premature labor, low birth weight, maternal and prenatal mortality.(4)

Global prevalence of anemia in preschool aged children is 47.4%, in pregnant woman 41.8% and in non pregnant woman 30.2%. Globally 818 million women (both pregnant and non-pregnant) and young children suffer from anemia and over half of these, approximately 520 million live in Asia. The highest prevalence for all three groups is in Africa, but the greatest number of people affected is in Asia. In Asia 58% of pre school aged children 65.1% of pregnant women and 68% of non pregnant women are anemic. (2,3)

In 1993 the World Bank ranked anemia as 8th leading cause of disease in girls and women in developing world. A total of 2170 million people are anemic by world health organization criteria, based on data collected in 1988 by WHO, It was these estimated that up to 56% of all pregnant women living in developing countries are anemic by WHO standard compared with 18% of all pregnant women in industrialized countries(1). The greatest burden of anemia is born by Asia and Africa where among all pregnant women it is estimated at 60% and 52%are anemic, and from these between 1% and 5% are severely anemic(Hb<7g/dl)[2]. In the Ethiopian setting the only well studied data is the Ethiopian DHS 2005 which has estimated the prevalence of anemia in women of reproductive age group (15 to 49years) to be 27%.

According to the World Health organization (WHO) anemia in pregnancy is defined as hemoglobin concentration (Hb) less than 11.0 g/dl, and severe anemia as Hb less than 7.0g/d. It must be noted that the cut-off points for severe and moderate anemia are to a large degree arbitrarily chosen and are not indicative of specific increased risk of mortality or morbidity either to the mother or her baby. It is however very useful to have these internationally agreed cut-off points especially for the purpose of being able to compare outcome for the various published studies. (5). Many authors have advocated

the use of Trimester specific cut-off points for anemia (4, 5). Hb level in the body varies to the level of altitude but most studies suggest that no correction of definition is necessary for woman at high altitude [6].

Nutritional anemia is by far the most common type of anemia world-wide, and mainly includes iron, foliate and vitamin B12 deficiencies. Iron deficiency anemia is it self caused by insufficient dietary intake of iron, chronic gastro-intestinal tract bleeding especially from hook worm, mal-absorption, and infections (Malaria, hook worm, schistosomiasis, TB, HIV), (7). One main etiologic classification of anemia identifies three main causation groups, namely Nutritional, Marrow disease and Hemolytic anemia.

Iron deficiency anemia occurs when iron loss exceeds the quantity of iron absorbed. Lack of body iron can be divided in to two categories.

1. Iron deficiency without anemia where the deficiency of iron is not sufficiently large to decrease Hb below the normal level.
2. The deficiency of iron is so severe that stores are absent and Hb is below the normal range. Women need more iron as a result of the loss of Hb with menstruation and high iron demands of pregnancy.

A small fall in Hb is a physiological response to the pregnancy state. The most prone to a drastic drop in there Hb are those who start pregnancy anemic e.g. those with poor diet, hemorrhage, hook worm, malaria, hemoglobinopathies, frequent pregnancy and twin pregnancies. (8).

In Africa the five commonest causes of anemia including iron deficiency, foliate deficiency, malaria, sickle cell diseases and AIDS. Causes of nutritional anemia in developing countries are mainly from low nutrition because of low amount of food intake. Taking green vegetable, meat and vitamin C containing foods increase the level of iron the body. (9)

A large representative nutritional study done among nine administrative regions in Ethiopia showed the overall anemia was 29.4% and iron deficiency 18%. This study shows that those who ate vegetables and meat were less frequently prone to anemia. The occurrence of anemia was significantly lower for those who eat vegetables 24% Vs who did not eat 32% and for those who ate meat 40.2% Vs for those who did not eat 55.2%. There was no significant association between parasite infection and anemia. In this study chronic

disease such as TB and probably HIV were statistically very significant, suggesting chronic disease as the second most important cause for anemia next to iron deficiency in Ethiopia (10). A cross sectional study done in Singapore national hospital in pregnancy from ANC to delivery the prevalence of anemia was 20.6% at booking and 15.3% at delivery. Multi-Para women of low socioeconomic status who booked late in pregnancy had a higher risk of anemia. Multivariate logistic regression analysis identified iron prophylaxis, hemoglobin level at booking, and history of anemia in previous pregnancies as significant 2.37, 95%CI (0.16-0.84). (11)

In a systematic review on hookworm related anemia among pregnant women by London school of tropical medicine UK, from 13 cross sectional studies 2 randomized control studies and 2 randomized treatment trials showed comparing uninfected women and women slightly infected with hookworm[1-1999 eggs]the standard mean difference[SMD]was-0.24.The SMD between women heavily[>4000eggs]infected and those slightly infected was-0.57.All identified intervention studies showed the benefit of de-worming for maternal and child health, but since a variety of outcome measures were employed quantitative evaluation was not possible. In the conclusion there were insufficient data to quantify the benefit of deworming and further studies warranted[12].In another study done on the risk factors for anemia on pregnant women attending ANC for the first time in Jimma University Hospital, published on Ethiopian Journal of health development 2008. the prevalence of anemia was 38.2%. In this study anemic cases were four times more likely to have a history of excess menstrual bleeding prior to the pregnancy and two times more likely to have hook warm infection also three times likely to have birth intervals of less than 24 months[13]. The existence of mild to moderate form of iron deficiency anemia was 30.4% among women of reproductive age. This study underlines the need for iron supplementation to all reproductive age women in there antenatal period(14)

In a study done in rural Malawi, an analysis of the determinants of anemia in pregnant women, the mean Hb concentration was significantly lower in the Primgravida 8.7g/dl than in the secondogravida 9.1g/dl or multigravida 9.2g/dl, Primgravida also experience significantly more iron deficiency and

malaria than second and multigravida(15). In a prospecting study done in Northern Nigeria the overall prevalence of anemia was 72%, anemia was most common in multipara and women who present at the late stages of pregnancy(16). In the study done in urban an rural Oyo state Nigeria socio demographic determinates of anemia in pregnancy at primary care level:32% were anemic, prevalence of anemia decrease with increased maternal age and mothers with birth intervals 24 months had a lower risk of anemia.(16)

The determinant factors and the prevalence of anemia in Ethiopia are not well studied. Limited studies are done to identify different risk factors which contribute for anemia in pregnancy and the magnitude of the problem; these limited studies are done in rural areas of Ethiopia.

Objectives

General Objectives

To assess the prevalence and contributing factors of anemia among pregnant women at the antenatal care setting in Addis Ababa.

Specific Objective

1. To determine the prevalence of anemia among pregnant women.
2. To identify the factors resulting in anemia among pregnant women.

3. Methods

Study Setting

The study was conducted in the capital city of Ethiopia, Addis Ababa. According to the national Ethiopian 2007 census data 2,738,248 people live in Addis Ababa. Addis Ababa lies at an altitude of 2300 meters (7546 feet) above the see level. There are ten administrative sub cities and 24 Government Health Centers in Addis Ababa. All Health Centers provide ANC service. Total fertility rate is 1.4, maternal mortality rate 673 per 100000 populations, antenatal coverage 81.0%, family planning service coverage 47.6%, HIV prevalence rate 7.5%. The estimated health service coverage in Addis Ababa is 93.3%.Women literacy rate is 74.4%, prevalence of wasting 7.4% and stunting 22.2% according to Ethiopian DHS 2005. The study setting was in the Health Centers.

Study Design

The study design is a quantitative cross sectional study of analytic type with internal comparison.

Source Population

The source populations were all pregnant women attending antenatal clinics of Governmental Health Centers in Addis Ababa during the study period which was from March 16 to April 16, 2010.

Study Population

The study populations were all pregnant women who attended the antenatal care clinics at the selected three health centers during the time of the study.

The inclusion criterion; was all pregnant women who come to attend the ANC clinics at the selected three Government Health Centers during the time of the study and who were willing to take part in the study after getting informed consent.

The exclusion criteria; was all pregnant women who come to attend the ANC clinics at the selected three Government Health Centers who were willing to take part in the study after getting informed consent and who were seriously ill or in labor.

Sample size Determination

The sample size is calculated using single population proportion based on the following assumptions.

1. The prevalence of anemia at a national level among pregnant women of the reproductive age (15 to 49) years was 27%. (EDHS 2005).
2. Significant level calculated at 95% confidence interval.
3. Margin of sampling error tolerable was assumed to be 5%.

$$N = \frac{Z^{\alpha}/_{2}.\ P.\ [1-P]}{d^2}$$

Where

n=Sample size

Z= $\alpha/2$ = Z value at 95% CI (1.96)

P= Estimated prevalence rate 27% [0.27]

d= Margin of error 5% [0.05]

$$n = \frac{1.96.1.96.\ 0.27\ [1-0.27]}{[0.05]^2}$$

n = 302.

302 samples with 10% non response, a total of 332 samples were included.

Sample size calculation for the internal comparison using the double proportion formula, from a cross-sectional study on nutrition as a factor to cause anemia done on nine representative regions in Ethiopia [comparing those who eat meat with those who did not eat meat](10).Calculation done using Epi- Info version 3.5.1.

CI……95%

Power……80%

Anemia in those who did not eat meat…… 55.20%

Anemia in those who ate meat……40.20%

CI	Power	Unex: exp	P in exposed	P in unexposed	SS
95	80	3:1	40.2	55.2	492
95	80	2:1	40.2	55.2	417
95	80	1:1	40.2	55.2	419 …
95	80	1:2	40.2	55.2	452
95	80	1:3	40.2	55.2	496

The sample size for the ratio 1:3 is 496 which is the sample size we take for our study.

With 10% non response rate, a total of 546 sample size is required. Thus the final sample size would be 546.

Sampling Procedures

Three Government Health Centers were selected from the total of 24 Health Centers all giving ANC service by simple random sampling method, these were Arada, Gulele and Kazanchis. The calculated sample size was used to recruit study subjects from the selected Health Center ANC clinics proportional to their client size. First the average number of clients who visit the selected ANC clinics in one month time was obtained by referring client registration books. The total number of clients from each health center for one month is multiplied with our sample size and divided with the total number of clients from all three health centers for one month. The numbers found by this calculation was distributed to the respective health centers and accordingly 142 for Arada, 162 for Kazanchis and 243 for Gulele which makes the total number of samples to be 547. Every consecutive client who comes for ANC service to the respective health centers and who were willing to take part in the study during the study period was involved in the study.

Data Collection Procedures

The data sources were interviews, ANC registers and laboratory registers.

A structured questionnaire prepared in English and translated in to Amharic was used for data collection. The variables for the questionnaires were adopted from previous related studies, Ethiopian demographic health survey and from survey on community based nutrition program by MOH and UNICEF. Hemoglobin level was collected from the ANC registers and laboratory registers.

Data was collected by properly trained data collectors, professional nurses with long time experience on antenatal care service. The data was collected in the next room to the ANC clinic to allow privacy and confidentiality. Pretest of tools was done prior to the main study; the pretest was conducted at one of the 24 Government Health Centers in Addis Ababa which was randomly selected that was Bole Health Center. After the pretest Bole Health Center was excluded from the study. And the lessons obtained from the pretest were included in the final tool. Training of data collectors was held for three days at the respective three Health Centers (Arada, Gulele and kazanchis) in the afternoon of working days.

Data Analysis

After the data collection, data entry was made using EPI INFO version 3.5.1 for each of the pre-coded questionnaire. Frequency output was used to check for missing values and outliers and cleaning was done using original code number.

The data was exported to SPSS version 15 statistical packages for further analysis. Descriptive statistics and summary measures were employed to the data. In order to investigate the association of dependent and independent variables and their degree of association were computed using odds ratio [OR] and with 95% of confidence interval and p-value for statistical significance. Then to control the effect of confounding factors and asses the separate effect of the variables, multiple logistic regression analysis was applied.

Operational definition

Anemia- : Is defined as a Hemoglobin level less than 11 gm/dl.

Server anemia : Is defined as a Hemoglobin level less than 7 gm/dl.

Moderate anemia : Is defined as a Hemoglobin level of 7 to 9.9 gm dl.

Mild anemia : Is defined as a Hemoglobin level of 10 to 10.9 gm/dl.

Teff intake : The intake of any type of food like Enjera or bread which is made from the cereal Teff.

Abortion : Is the termination of pregnancy by the removal or expulsion from the uterus of a fetus or embryo, resulting in or caused by its death.

Stillbirth : A birth in which the fetus does not exhibit any signs of life when completely removed or expelled from the birth canal at or above 28 completed weeks of gestation.

Miscarriage : Is the spontaneous end of pregnancy at a stage where the embryo or fetus is incapable of surviving, generally prior to 28 weeks of gestation.

Chronic disease : A disease that persists for a long time. A chronic disease is the one lasting for 3 months or more.

Chronic kidney disease : A term used widely to describe kidney damage or reduced kidney function(irrespective of the cause) that persists for more than three months.

4. RESULT

5.

All the eligible respondents have agreed to participate in the study making the response rate 100%.A total of 547 pregnant women involved in this study.

Socio demography characteristics

The results of the socio demographic characteristic variables of all 547 pregnant women are presented as follows. Most woman lie in the age group 25-29 (41.5%) followed by 20-24 (29.4) the remaining 30-34 (13.4%) and 15-19 (9.9 %).

Most of the study participants were married (90.1%) followed by never married (4.2%) and then separated (2.9%) and widowed (1.5%) divorced (1.1%). Regarding religion most of them are Orthodox Christian (75.3%) followed by Muslim (17.4%) then Protestant (6.6%) and Catholic (0.5%). Those who attended school are 82.4% while those never attended school 17.6%.As to the level of education most of them were from 0 to 12 grades (69.8%) while the rest are collage diploma (5.1%) certificate (3.7%) and degree (2.4%). As to the occupation most (46.8%) were house wife next merchants (17.7%) the daily laborer (6.6%) civil servant (5.9%) unemployed (5.7%) and student (2.9%). Regarding the average monthly income, most of the respondents fall in the income range of 500-999 birr group (31.1%) followed by less than 500 (26.3%) then 4500 and above (9.9%) the rest lie in less proportion. (Table 1)

Table1: Socio demographic characteristics of pregnant women attending antenatal clinic at the government health centers, Addis Ababa, March 2010.

Characteristics	Number	Percentage
Age category (n=544)		
15-19	54	9.9%
20-24	161	29.4%
25-29	227	41.5%
30-34	76	13.9%
35-39	23	4.2%
40 and above	3	0.5%
Religion (n=547)		
Orthodox	412	75.3%
Catholic	3	0.5%
Protestant	37	6.8%
Muslim	95	17.4%
Marital Status (n=546)		
Never Married	23	4.2%
Married and live together	493	90.1%
Separated	16	2.9%
Divorced	6	1.1%
Widowed	8	1.5%
Education (n=547)		
Illiterate	96	17.6%
Read and write	9	1.6%
1-6	113	20%
7-12	266	48.6%
College and above	63	11.5%
Occupation (n=543)		
Unemployed	31	5.7%
Student	16	2.9%
Daly laborer	36	6.6%
Housemaid	40	7.3%
House wife	256	46.8%
Employed at private sector	35	6.4%
Merchant	97	17.7%
Civil services	32	5.9%
Husband/Partner Education (n=523)		
Yes	491	93.8%
No	32	6.1%
Income (n=466)		
< 500	143	30.7%
500-1499	231	49.6%
1500-2499	55	11.8%
2500-3499	20	4.3%
>3500	17	3.6%
Household size (n=539)		
1-3	359	66.6%
4-6	162	30.1%
7-8	18	3.3%

Menstruation and pregnancy characteristics

For most of the respondents the age of menarche was 15 years (22.9%) followed by 14 year (14.1%) then 16 years (11.2%) and 13 year (7.2%). Most of the respondents have regular menstruation 73.3%, irregular menstruation (24.9%). For most of them the duration was 3 days (35.1%) followed by four days (25.6%) then 5 days (18.5%), 7 days (10.1%).

This pregnancy was the first time for (45.7%) and not the first time for (54.3%). Those who had a history of abortion were (23.9%) and never had (31.1%). As to the number of abortions most had one (16.6%) then two (5.3%) and 3 (1.3%). (Table 2)

Table2: Menstruation and pregnancy related characteristics of pregnant women attending antenatal clinics at the government health centers, Addis Ababa, March 2010.

Characteristics	No	%
Regularity of menstruation (n=539)		
Regular	403	74.8%
Irregular	136	25.4%
Amount of menstruation by the no of pads used (n=541)		
Very heavy	36	6.6%
Heavy	58	10.6%
Moderate	346	63.3%
Low	101	18.5%
Duration of menstruation in days (n=535)		
2-4 days	348	65.0%
5-7 days	187	34.9%
No of Pregnancies (n=547)		
1st Pregnancy	250	45.7%
Multiple Pregnancy	297	54.3%
Ever had abortion (n=301)		
Yes	131	43.5%
No	170	56.5%
Number of abortion (n=128)		
1	91	71.1.%
2-4	37	28.9%
Miscarriages (n=281)		
0	234	83.2%
1	44	15.7%
2-3	3	1.1%
Still births(n=289)		
0	285	98.6
1	2	0.7
2-3	2	0.7
Number of live birth in life time (n=201)		
1	109	54.2%
2	58	28.9.%
3	26	12.9%
4	8	3.9%
Is this pregnancy twin(n=433)		
Yes	9	2.1%
No	424	97.9%

Dietary Characteristics of the respondents

Most of the respondents has three main meal frequency in a day (78.1%) while once only (14.6%) and two times (5.9%). Additional food intake (snack) in a day (19.9%) said once, (43.3%) said twice, and (14.4%) said three times . Most of the respondents took food made 0f teff daily (88.3%). Dark green leafy vegetables were taken daily (22.7%) while (46.4%) took 1 to 2 times in a week and once in two weeks (11.0%). For meat fish and egg most respondents said once in two weeks (24.9%) and those who don't take are (23.4%). (Table 3)

Table3: Diet related characteristics of pregnant women attending antenatal clinics at the government health centers, Addis Ababa, March 2010.

Characteristic	No	%
Main meal frequency in a day (n=539)		
Once	80	14.8%
Two times	32	5.9%
Three times	427	79.2%
Snack (n=425)		
Once	109	25.7%
Two times	237	55.8%
Three times	79	18.6%
Teff intake (n=543)		
Don't take	17	3.1%
Daily	483	88.9%
1-2 times in a week	28	5.2%
3-6 times in a week	7	1.3%
Ones in two weeks	8	1.5%
Dark Green Leafy Vegetable (n=539)		
Don't take	50	9.2%
Daily	124	23.1%
1-2times in a week	254	47.1%
3-6 times in a week	51	9.5%
Ones in two weeks	60	11.1%
Meat (excluding organ meat) (n=493)		
Don't take	128	25.9%
Daily	26	5.3%
1-2 times in a week	136	27.6%
3-6 times a week and more	40	8.1%
Ones in two weeks	163	33.1%
Beans, Peas, Lentils (n=537)		
Don't take	6	1.1%
Daily	389	72.4%
1-2 times in a week	95	17.7%
3-6 a week and more	34	6.3%
Ones in two weeks	13	2.4%
Milk and milk products (n=540)		
Don't take	155	28.3%
Daily	136	24.9%
1-2 times in a week	143	26.1%
3-6 times in a week	38	6.9%
Ones in two weeks	68	12.4%
Tea or Coffee intake (n=545)		
Don't take	29	5.3%
Daily	490	89.6%
1-2 times in a week	19	3.5%
3-6 times a week	4	0.7%
Ones in two weeks	3	0.5%
Organ Meats (n=533)		
Don't take	422	77.1%
Daily	4	0.7%
1-2 times in a week	45	8.2%
3-6 times a week and more	16	2.9%

Health Condition of the respondents

Most of the respondents gave history of Gastritis or PUD (25.0%). History of chronic disease such as TB and HIV /AIDS for 4% of the respondent 6% of the respondents was HIV positive and from those (3.8%) are on ART. 4.2% give a history of hemorrhoids and gum bleeding for 14.8%. (Table 4)

Table4: Health related characteristics of pregnant women attending antenatal clinics at the government health centers, Addis Ababa, March 2010.

Characteristics	No	%
Any bleeding(internal or external) (n=540)		
Yes	15	2.78%
No	525	96.0%
Gastritis or duodenal ulcer (n=540)		
Yes	137	25.0%
No	407	74.4%
Bleeding from GI tract (n=135)		
Yes	15	11.1%
No	120	88.9%
Tuberculosis (n=524)		
Yes	8	1.5%
No	516	94.3%
Malaria (n=547)		
Yes	7	1.3%
No	540	98.7%
Any chronic disease (n=546)		
Yes	22	4.0%
No	524	95.8%
Hemorrhoid (n=544)		
Yes	23	4.2%
No	521	95.8%
Gum bleeding (n=546)		
Yes	81	14.8%
No	465	85.1%
HIV positive (n=534)		
Yes	33	6.1%
No	501	93.8%
Taking ART (n=33)		
Yes	22	66.7%
No	11	33.3%

The prevalence of Anemia

In this study the prevalence of anemia among pregnant women attending antenatal clinics in Addis Ababa was 14.1%. From the total of 547 study participants 77 of them had (hemoglobin level <than 11 mg/dl). From these 2.5% were severe anemia, 22% moderately anemic and 75% mild anemic.

The association of anemia with different socio demographic variables

Most of the anemic cases were found in the age group of 25-29 years, 34 out of total of 77 anemic were in this age group, when we see it from the frequency distribution although it is not significant p-value and confidence interval [table 5]. The other association is seen from the religion category orthodox Christians were more anemic than the other religion groups 16.3% although it is not statistically significant. All other socio-demographic variables was not seen to be significant in the univariate and multivariate logistic regression analysis crude OR and adjusted OR and P-value was not seen to be significant. (Table 5).

The Association of Anemia with Menstruation and Pregnancy Related Variables

Those who have heavy menstrual bleeding are found to be more anemic than those who had moderate and low menstrual bleeding 17.2% for the first and 15% for the second group and 19.9% for the third group but the difference is not significant. No significant difference seen between those who had regular and irregular menstruation (table 6).

No significant difference on anemic status seen on primi-gravidas and multi-gravidas and there was also no difference observed on those who had abortion and those who didn't have abortion, on the other variables twin pregnancy and number of children No significant association observed.

The association of anemia with Diet related variables

Over all no significant association was seen between anemia and different diet related variables as seen on the univariate analysis, crude odds ratio and p-value (table 7). Although not significant there are notable differences on the number of anemic cases seen in some of the variables in this category. Those who ate teff (engera) daily seen to be less anemic than those who eat engera once in two weeks 13.5% for the first and 23.5% for the second group, similarly those who ate meat daily were less anemic than those who eat meat once in two weeks time 11.5% for the first and 15.6% for the second group. Those who ate beans peas like foods were less anemic than those who ate once in two weeks 14.9% and 33.3%. No association observed on the other variables like eating green leafy vegetables.16.3% although it is not significant.

The association of anemia with Health and medication related variables.

The very strong association was seen on both univariete and multivariate analysis among these who had chronic diseases 40.9 % were anemic when compared with 13.0% who did not have chronic diseases crude OR 4.643(1.912-11.274) adjusted OR 0.319 (0.117-0.871) (table 8&9).

The other significant association was also seen on those who had chronic kidney disease 31% were anemic in compared to 12.7% who didn't have chronic kidney diseases crude OR 3.08(1.527-6.250) adjusted OR for those who did not have chronic kidney disease is adjusted OR 0.314(0.140-0.707). Those who took NSAIDS and other Anti Inflammatory Drugs were anemic in the higher number 29.4% when compared with13.1% of those who did not take those drugs, for those who did not take those drugs crude OR 0.362.

The positive HIV status, tuberculosis and those who had hemorrhoids found to be associated with anemia although not significant OR, 95% CI and P-value, From HIV positives 21.2% were anemic as compared with 13.6% who were HIV negative, those who had tuberculosis 25.0% were anemic as compared to 13.8% who didn't have tuberculosis and hemorrhoids 21% were anemic as compared to 13.8% who didn't have hemorrhoids.

Table 5: Socio demographic characteristics associated with anemia at the government health center antenatal clinics, Addis Ababa, March 2010.

Characteristic	Anemia		Total	Crude OR	95% CI
	Yes	No			
Age group (n=547)					
15-19	8(14.8%)	46(85.2%)	54	1.333	0.323-5.506
20-24	22(13.5%)	141(86.5%)	163	1.196	0.331-4.321
25-29	34(14.9%)	194(85.%)	228	1.344	0.382-4.723
30-34	10(13.2%)	66(86.8%)	76	1.162	0.294-4.593
>53	3(11.5%)	23(88.5%)	26	1.0	
Religion (n=547)					
Orthodox	67(16.3%)	345(837%)	412	1.856	0.890-3869
Others	1(2.5%)	39(97.5%)	40	0.245	0.030-2.002
Moslem	9(9.5%)	86(90.5%)	95	1.0	
Marital Status((n=543)					
Never married	6(26.1%)	6(26.1%)	23	2.471	0.250.24.463
Married and living together	65(13.2%)	65(13.2%)	494	1.061	0.128-8.761
Separated	3(20.0%)	3(20.0%)	15	1.750	0.151-20.231
divorced	2(33.3%)	2(33.3%)	6	3.500	0.236-51.899
Widowed	1(12.5%)	1(12.5%)	8	1.0	
Education level(n=544)					
Illiterate	12 (12.5%)	84(87.5%)	96	1.179	0.610-2.279
Read& write	1 (11.0%)	8(88.8%)	9	0.511	0.283-2.454
1-6 grade	16(14.1%)	97 (85.8%)	113	03796	0.267-2.373
7-12 grade	33(12.4%)	232(87.5%)	265	0.487	0.198-1.194
College and above	11(18.0%)	50(81.9%)	61	1.0	
Occupation(n=511)					
Unemployed	7(22.6%)	24(77.4 %)	31	1.264	0.372-4.296
Student	4(25.0%)	12(75.0%)	16	1.444	0.343-6.086
Daily laborer	3(8.3%)	33(91.7%)	36	0.394	0.090-1.727
House maid	3(7.5%)	37(92.5%)	40	0.351	0.080-1.534
House wife	36(14.1%)	220(85.9%)	256	0.709	0.273-1.843
Employed at private sector	5(14.3%)	30(85.7%)	35	0.722	0.197-2.644
Merchant	12(12.4%)	85(87.6%)	97	1.0	
Income(n=466)					
<500	27 (18.9%	116(81.11%)	143	1.490	0.678-3.273
500-1499	21(9.11%)	210 (90.0%)	231	0.640	0.287-1.425
1500-2499	12(21.8%)	43(78.2%)	55	1.786	0.704-4.499
2500-3499	1(5.%)	19(95.0%)	20	0.373	0.040-2.802
>3500	4(23.5%)	13(76.6%)	17	1.0	

*** Others = Catholic + Protestant**

Table 6: Menstruation and pregnancy related characteristic associated with anemia at the government health center antenatal clinics, Addis Ababa, March 2010.

Characteristic	Anemia		Total	Crude	
	Yes	No		OR	95% CI
Regularity of menstruation(n=543)					
Regular	54(13%)	349(86.6%)	403	1.0	
Irregular	22(16.2%)	114(83.8%)	136	1.247	0.728-2.138
Don't Remember	1(25%)	3(75%)	4	2.154	0.220-21.088
Menstruation amount by no of pads used (n=541)					
Very heavy	3(8.3%)	33(91.71)	36	1.0	
Heavy	10(17.2%)	48(82.8%)	58	2.292	0.586-8.966
Moderate	52(15.3%)	293(84.71)	345	1.990	0.589-6.723
Low	10(9.9%)	91(90%)	101	1.205	0.313-4.664
I don't remember	0(0%)	1(100%)	1	0.000	0.000
Gravid Status (n=547)					
Prime gravid	36(14.4%)	214(85.6%)	250	1.058	0.648-1.703
Multi gravid	41(13.8%)	256(86.2%)	297	1.0	
Ever had abortion(n547)					
Yes	18(13.8)	113(86.3%)	131	0.966	0.507-1.572
No	24(14.1)	146(85.9%)	170	1.0	
Live Births (n=201)					
0	16(14.7%)	93(85.3%)	109	1.0	
1-2	7(12.1%)	51(87.91%)	58	1.104	0.493-2.474
3-4	3(11.5%)	23(88.5%)	26	0.881	0.325-2.387
5-6	3(37.5%)	5(62.5%)	8	0.837	0.217-3.223
This pregnancy twin(n=358)					
Yes	0(0%)	9(100%)	9	0 .000	0 .000
No	55(13.%)	369(87%)	424	0.610	0.350-1063
Don't Know	21(19.6%)	86(80.41)	107	1.0	

Table 7: Diet related factors associated with anemia at the government health center antenatal clinics, Addis Ababa, March 2010.

Characteristic	Anemia		Total	Crude OR	95% CI
	Yes	No			
Main meal frequency in a day(n=546)	5(6.3%)	75(93.8%)	80	0.400	0.040-3.999
One Times	4(12.5a5)	28(87.5%)	32	0.857	0.081-0.097
Two Times	67(15%)	360(84.3%)	427	1.007	0.132-9.425
Three Times	1(14.2%)	6(85.7%)	7	1.0	
Done remember					
Snack intake in a day(n=523)					
Don't take	13 (11.9)	96(88.1%)	109	0.587	0.147-2.338
One times	38(16.8%)	199(84.0%)	237	0. 827	0.225-3.044
Two times	12 (15.2)	67 (84.6)	79	0.776	0.192-3.140
Three times and more	10 (10.2)	88 (89.8)	98	1.0	
Teff and teff products intake(n=543)					
Don't take	4(23.5%	13(76.5%)	17	0.308	0.015-6.117
Daily	65(13.5%)	418(86.65%)	483	0.156	0.010-2.517
1-2 times in a week	5(17.9%)	23(82.1%)	28	0.217	0.012-4.094
3-6 times in a week	0 (0)	7 (100)	7	0.000	0.000
Once in 2 weeks	2 (25)	6 (75)	8	1.0	
Dark Green leafy vegetables(n=515)					
Don't take	3(6.8%)	41(93.2%)	44	1.0	
Daily	13(17.6%)	61(82.4%)	47	2.913	0.781-10.863
1-2 times in a week	45(14.5%)	265(85.5%)	310	2.321	0.659-7.815
3-6 times in a week	11(15.1%)	62(84.9%)	73	2.425	0.637-9.225
Once in two weeks	5(12.2%)	36(87.8%)	41	1.898	0.424-8.505
Meat (excluding organ meat)(n=493)					
I don't take	20(15.6)	108(84.4%)	128	1.019	0.418-2.484
Daily	3(11.5%)	23(88.5%)	26	0.717	0.173-2.966
1-2 times in a weak	19(14.0%)	117(86.0%)	136	0.893	0.365-2.188
3-6 times a weak	10(25.0%)	30(75.0%)	40	1.833	0.649-5.182
Once in 2 weeks	17(10.4)	146(89.6%)	163	1.0	
Beans peas and like foods(n=537)					
Don't take	2(33.3%)	4(66.7%)	6	1.0	
Daily	56(14.4%)	333(85.6%)	389	1.000	0.53-18917
1-2 times in a week	10(10.5%)	85(89.5)	95	0.336	0.030-3-771
3-6 times in a week	4(11.76%)	30(85.2%)	34	0.267	0.009-3653
Once in two weeks	3(23.1%)	10(76.9%)	13	0.600	0.059-9156
Milk and milk products(n=540)					
Don't take	16((10.3%)	139(89.7%)	155	0.789	0.052-1.606
Daily	27(17.9%)	109(80.1%)	136	0.619	0.0.114-3.366
1-2 times in a week	18(12.6 %.%)	125(87.4%)	143	0.360	0.025-1.996
3 -6 times in a week	8(21.1%)	30(78.9%)	38	0.667	0.108-4097
Once in 2 weeks	6(8.8%)	62(91.2%)	68	1.0	
Tea and Coffee(n=545)					
Don't take	6(20.7%)	23(79.3%)	29	1.0	
Daily	67(13.7%)	423(86.3%)	490	3.607	0.238-1.549
1-2 times in a week	4(21/1%)	15(78.9%)	19	1.002	0.246-4.240
3-6 times in a week	0(0%)	4(100. %)	4	0.000	0.000
Once in two2 weeks	0(0%)	3(100%)	3	0.000	0.000

Table 8: Health related factors associated with anemia at the government health center antenatal clinics, Addis Ababa, March 2010.

Characteristic	Anemia		Total	Crude OR	95% CI
	Yes	No			
Any bleeding(internal and external) (n=540)					
Yes	2(13.3%)	13(86.7%)	15	1.083	0.240-4.897
No	75(14.3%)	450(85.7%)	525	1.0	
Gastritis or PUD (n=544)					
Yes	26(19.0%)	111(81.05%)	137	1.0	
No	50(12.36)	357(87.7%)	407	0.598	0.356-1.005
NSAIDS and any inflammatory drugs (N=548)					
Yes	10(29.4%)	24(70.6%)	37	1.0	
No	67(13.1%)	444(80.9%)	511	0.362	*0.116-0.791
Frequent diarrhea episode(n=545)					
Yes	4(13.8%)	25(86.2%)	29	0.971	0.328-2.871
No	73(14.3%)	443(85.9%)	516	1.0	
Intestinal parasites(n=545)					
Yes	8(13.6%)	51(86.4%)	59	1.0	
No	68(14.0%)	418(86.0%)	486	1.037	0.472-2.281
HIV infection(n=534)					
Yes	7(21.2%)	26(78.8%)	33	1.714	0.716-4.104
No	68(13.6%)	433(86.4%	501	1.0	
Taking ART drags (n=33)					
Yes	6(27.2%)	16(72.7%)	22	3.600	0.371-34.936
No	1(9.0.%)	11(90.9%)	11	1.0	
Tuberculosis (n=524)					
no	712(13.8%)	445 (86.2%)	516	1.0	
Yes	2(25.0%)	6 (75.0%)	8	1.167	0.166-8.186
Malaria (n=547)					
Yes	1(14.3%)	6(85.7%)	7	1.018	0.121-8.570
NO	76(14.1%)	464(85.5%)	540	1.0	
Chronic kidney diseases (n=547)					
Yes	13(31.0%)	29(69.0%)	42	3.089	* 1.527-6.250
No	64(12.7%)	441(87.3%)	505	1.0	
Any Chronic disease(n=546)					
Yes	9(40.9%)	13(59.1%)	22	4.643	*1.912-11.274
No	68(13.0%)	456(87.0%)	524	1.0	
Hemorrhoids (n=544)					
Yes	5(21.7%)	18(78.3%)	23	0.577	0.208-1.603
No	72(13.8%)	449(86.2%)	521	1.0	
Iron supplementary tablet (n=537)					
Yes	57(12.8%)	388(87.2%)	445	1.0	
No	17(18.5%)	75(18.5%)	92	1.543	0.828-13990

-

= P.value <0.05

Table 9: Selected risk factors associated with anemia at the government health center antenatal clinics, Addis Ababa, March 2010.

Characteristic	Anemia			Crude OR,95%CI		Adjusted OR, 95%CI	
	Yes	No					
Ever attended school(n=547)							
Yes	65(14.4%)	386(85.6%)	451	1.179	0.610-2.279	1.335	0.638-2.793
No	12(12.5%)	84(875%)	96	1.0		1.0	
Income(n=540)							
< 500	27(18.9%)	116(81.1%)	143	1.493	0.678-3.273	1.341	0.564-3.188
500-1499	21(9.1%)	210(90%)	231	**0.640**	**0.287-1.429**	**0.523**	**0.219-1.250**
1500-2499	12(21.8%)	43()78.2%	55	**1.786**	**0.709-4.49%**	**1.641**	**0.614-4.386**
2500-3499	1(5.0%)	19(95.0%)20	20	**0.337**	**0.040-2.802**	**0.207**	**0.023-1.897**
>3500	4(23.5%)	13(76.5%)	17	**1.909**	**0.353-7.251**	**1.657**	**0.410-6.692**
Don't know	10(135%)	64(86.5%)	74	**1.0**		**1.0**	
Gravida status(n=547)							
Primi gravid	36(14.4%)	214(85.7%)	250	**0.810**	**0.502-1.872**	**0.935**	**0.542-1.614**
MultI gravid	41(13.8%)	256(86.2%)	297	**1.0**		**1.0**	
Dark Green leafy vegetables(n=515)							
Don't table	3(6.8%)	41(93.2%)	44	**1.0**		**1.0**	
Daily	13(17.6%)	61(82.4%)	47	**2.913**	**0.781-10.863**	**3.541**	**0.863-14.524**
1-2times in a week	45(14.5%)	265(85.5%)	310	**2.321**	**0.689-7.815**	**2.718**	**0.744-9.921**
3-6 times in a week	11(15.1%)	62(84.9%)	73	**2.425**	**0.637-9.225**	**2.906**	**0.698-12.102**
Once in 2 weeks	5(12.2%)	36(87.8%)	41	**1.898**	**0.424-8.505**	**2.288**	**0.454-11.518**
Meat (excluding organ meat) (n=493)							
Don't take	20(15.6%)	108(84.4%)	128	**1.019**	**0.481-2.488**	**1.040**	**0.400-2.707**
Daily	3(11.5%)	23(88.5%)	26	**0.717**	**0.173-2.966**	**0.545**	**0.119-2.500**
1-2 times in a week	19(14.0%)	117(86.0%)	136	**0.893**	**0.365-2.188**	**0.651**	**0.239-1.776**
3-6times in a week	10(25%)	30(75%)	40	**1.833**	**0.649-5.182**	**1.767**	**0.567-5444**
Once in 2 weeks	17(10.4%)	146(89.6%)	163	**1.0**		**1.0**	
Gastritis(n=544)							
Yes	26(19.0%)	111(80.0%)	137	**1.0**		**1.0**	
No	50(12.3%)	357(87.7%)	407	**0.598**	**0.356-1.005**	**0.957**	**0.525-1.745**
Chronic kidney disease (n=547)							
Yes	13(31.0%)	29(69.2%)	42	**3.089**	**1.527-6.250**	**2.860**	***1.261-6.489**
No	29(69.0%)	441(87.3%)	505	**1.0**		**1.0**	
Any chronic disease(n=546)							
Yes	9(40.9%)	13(59.1%)	22	**4.643**	**1.912- 11.274**	**3.414**	***1.254 - 9.308**
No	68(13.0%)	456(87.%)	524	**1.0**		**1.0**	
Iron tablet (n537)							
Yes	57(12.8%)	388(87.2%)	445	**1.0**		**1.0**	
No	17(18.5%)	75(18.5%)	92	**1.543**	**0.828- 13.992**	**0.447**	**0.083- 2.418**
NSAIDS and other anti-inflammatory drugs(n=547)							
Yes	10(29.5%)	23(70.6%)	36	**1.0**		**1.0**	
No	67(13.1%)	444(80.9%(	511	**0.362**	**0.116-0.791**	**2.113**	**0.786-5.678**

*** = p.value < 0.05**

5. Discussion

In this study the prevalence of anemia among the pregnant women attending antenatal clinics in Addis Ababa was 14.1%. Of these 2.5% were having severe anemia, 22% moderate anemia and 75% mild anemia.

Chronic diseases were the main contributing factors for anemic status of pregnant women; pregnant women with chronic disease were 40.9% when compared with 13% of those who did not have chronic disease. This was also seen after controlling for the other confounding factors on multiple logistic regressions.

Chronic kidney disease was the second significant contributing factor for anemia in pregnancy 31.4% of those with chronic kidney disease were anemic as compared with 16.2% of those who did not have chronic kidney disease and this has been also seen on multiple logistic regression model. In addition Gastritis, Not taking Iron supplementation tablets, not taking Iron rich foods like meat was the main factors for anemic status of the pregnant women but this was not statistically significant.

The prevalence of anemia in this study is higher than in most of the developed centuries, but when we see it with a study done in pregnant Ghanaian women from urban area the prevalence of anemia was 34%, this may be explained by the high prevalence of malaria infection in Ghana and very low prevalence of malaria in Addis Ababa which both of them has different altitude above the sea level (21).

The prevalence of anemia in this study was very much similar with the findings of Ethiopia demographic health survey (EDHS) 2005 report of 27% prevalence of anemia, 70 % mild anemic, 8% moderately anemic and just over 1% sever anemic. In this EDHS 2005 report it was indicated that Addis Ababa had the smallest prevalence of anemia 14.6%. (21).

In another cross- sectional survey on iron deficiency anemia done in nine administrative regions in Ethiopia in 2005 showed the prevalence of anemia overall was 30.4% and among the nine regions Addis Ababa had the lowest prevalence of 7.5% (10).

Orthodox Christian was found to be more anemic than the other religion groups, this may be explained by the two months of fasting period for orthodox christens and the absence of Iron rich diet mainly meat. Meat contains heam Iron which is two to three times more absorbed then the non- heam iron which is found from plant based foods and a small amount of heam iron will improve the amount in absorption of non heam iron (3).

No difference in anemic status observed among the literate and illiterate groups and also by their level of education. Regarding the employment status and income no difference observed in the anemic status of the pregnant women.

Regarding menstruation those who had regular menstruation was less anemic 13.4% than those who had irregular menstruation 16.2% also those who had lower amount of menstrual bleeding were less anemic 9.1% than those who had excess (heavy) menstrual bleeding although not statically significant, this has been seen in different other studies, in a study done in jimma Hospital 2006 on risk factors for anemia in pregnant women those who had excess menstrual bleeding were four times more anemic (16).

Over all no significant association observed between different diet related variables and anemic states of the pregnant women, but eating Iron rich foods in higher amount found to reduce the anemic states of the pregnant women. These who ate teff (Enjera) daily were anemic in lesser number 13.5% than those who ate teff (Enjera) once in two weeks 23.5%. Similarly those who ate meat daily were less in the number of anemic 11.5% than those who at meat once in two weeks. This association was seen also in the large representative nutritional study done among nine administrative region in Ethiopia the occurrence of anemia for those who ate meat 40.2% versus for those who did not eat meat 55%, for those who eat vegetable 24% versus who did not eat 32% . In this study no difference in anemic status was seen among those who eat green leafy vegetables frequently. Dirking Tea or coffee reduces the absorption of Iron in the body which leads to anemia; in our study such difference was not observed.

The very significant association in this study was found among health related variables. Those who had chronic disease were more anemic in number

40.9% as compared with 13.0% of those who did not have chronic disease. This was also seen after controlling for the other confounders in multiple logistic regression OR (95%CI) 3.414 (1.252-9.308).

The other significant association with anemia was seen among those who had chronic kidney disease 31% were anemic as compared with 12.7% for those who didn't have chronic kidney disease. This was also seen on multiple logistic regression after adjusting for the other confounding variables OR 95% CI 2.860 (1.261-6.489).

This type of statistically very significant association was also seen on the large representative nutrition study done on nine administrative regions in Ethiopia which showed that chronic disease such as TB and Probably HIV suggesting chronic disease as the second most important cause of anemia next to iron deficiency anemia in Ethiopia (10).

Regarding the etiology of anemia of chronic disease 75% of clinical causes are secondary to infection, inflammation including connective tissue and neoplastic disease (22).

Anemia is also commonly associated with chronic renal failure but the etiology of anemia of chronic renal failure is slightly different from the anemia of chronic disease, it probably results from a combination of erythropotin deficiency and anemia of chronic disease, apart from chronic renal failure the anemia of chronic disease is generally unresponsive to iron therapy.

The other very strong relation observed in those who are getting iron supplementary medication had very low incidence of anemia 12.8% when compared with these who are not taking iron supplementary medication 18.5% this was not statistically significant but in another study on iron deficiency anima published in Ethiopian medical journal 2008(Melku Umeta) showed statistically significant difference .

Strength and limitations of the study

Strength of the Study

1. The use of trained nurses in data collection was the strength of the study.
1. All the respondents were interviewed and the response rate was 100%.

Limitation of the study

1. The true effect of exposure variables might have been concealed because of the use of secondary data on the anemic status pregnant women (hemoglobin level was not done by the prime investigator).
2. Respondents might have not told us their real exposure status to different variables (social desirability bias) and this might have disguised the study result.

6. Conclusion & Recommendation

1. The prevalence of anemia among pregnant women in Addis Ababa is 14.1%. 25% severely anemic 22% moderately anemic and 75% mild anemic.
2. Chronic diseases like TB and HIV and chronic kidney disease are the main factors which contributed for anemic status among pregnant women, statistically significant both on univariete and multivariate logistic regression analysis.

Recommendation

1. The prevalence of anemia among the pregnant women in Addis Ababa is 14.1%, so the appropriate public health measure should be taken by the concerned health authorities.
2. Chronic diseases including chronic kidney diseases are the main factors contributing to anemic status of pregnant women, so in addition to Iron supplementation treating the underlying chronic disease is very crucial.
3. Iron supplementation during pregnancy and iron rich diets during pregnancy is recommended.

7. References

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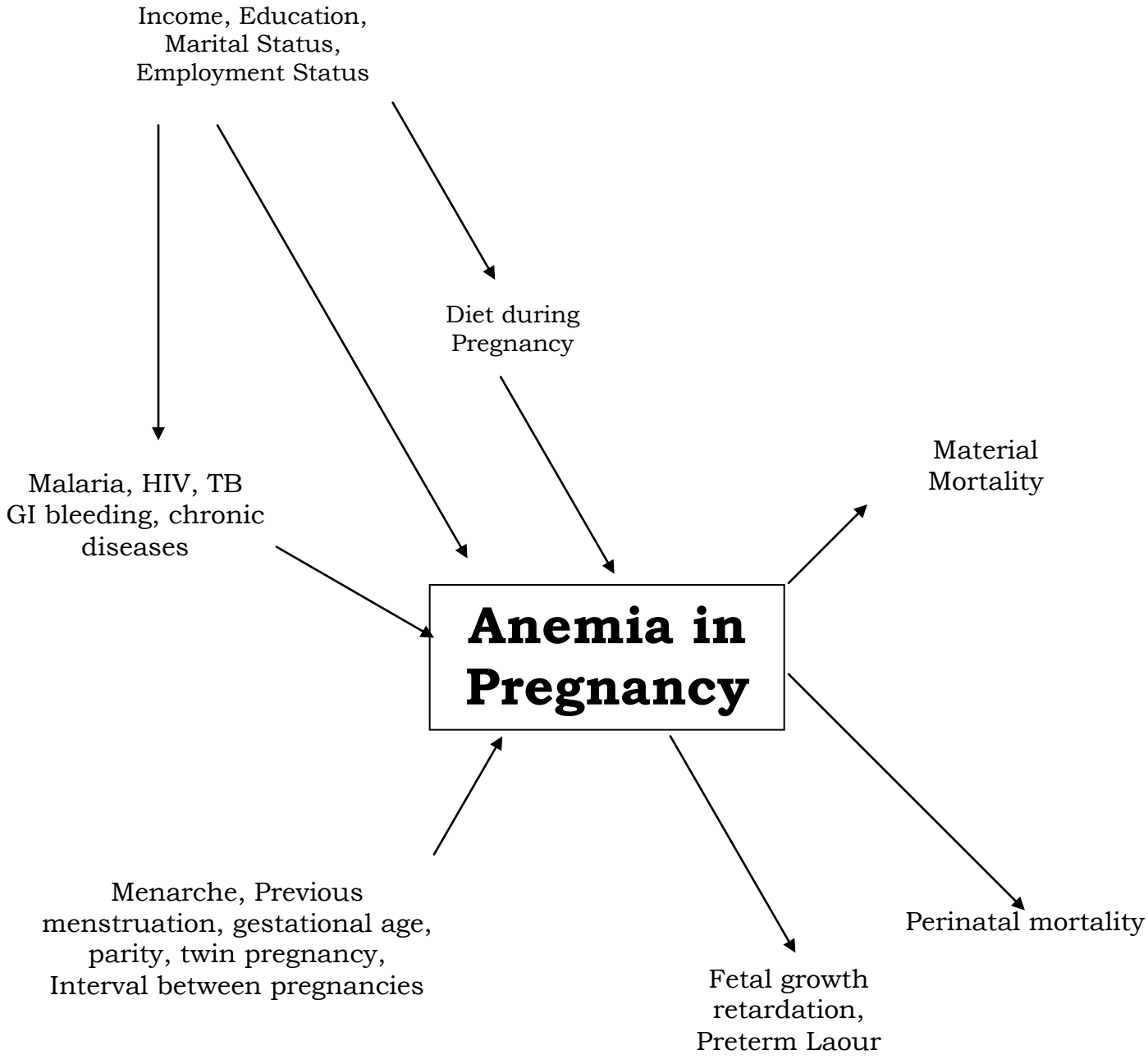
8. Annex-I

Conceptual frame work of anemia in pregnant women



Annex II. Consent form.

Addis Continental Institute of Public Health

Consent form for the study of anemia in pregnant women who attend antenatal care clinics at the health centers in Addis Ababa.

My name is ---------- I am working with the research team of ACIPH at this------- health center ANC clinic. I am doing interview of pregnant women about their socio-economic and other determining factors relating to anemia in pregnancy. Anemia in pregnancy is a major public health problem for maternal morbidity and mortality also for adverse outcome of pregnancy. The information which will be collected by this questionnaire will be useful for the improvement of anemia in pregnancy.

I would like to insure you that the interview is private and confidential, your name will not be mentioned in the questionnaire and the information we collect will be used only for research purpose. Your participation is voluntary and you have the full right to refuse to take part in or interrupt the interview at any time.

Are you willing to participate in the study?

1] Yes 2] no

If the answer is yes proceed to the interview.

If the answer is no, thanks. Go to the next client.

ANNEX -III

STRUCTURED QUESTIONAIRE

SOCIO-DEMOGRAPHIC CHARACTORSTICS

101	**How old are you(age in completed year)**	**Age ----------**
102	**What is your marital status**	**1. Never Married** **2. Married and live together** **3. Separated** **4. Divorced** **5. Widowed** **6. Other**
103	**What is your religion**	**1. Orthodox** **2. Catholic** **3. Protestant** **4. Muslim** **5. Traditional** **6. Other----------**
104	**Have you ever attended school**	**1. Yes** **2. No → 107**
105	**Can you read and write**	**1. No** **2. Read only** **3. Read and write**
106	**What is the highest grade you completed**	**1. grade------** **2. Technical-and vocational certificate** **3. University or college diploma** **4. University or college degree and above**
107	**What is your occupation(what kind of work you mainly do)**	**1. Unemployed** **2. Student**

		3. Daly laborer 4. Housemaid 5. House wife 6. Civil services 7. Employed at private sector 8. Merchant 9. Other----------
108	If you are working how much do you earn per month	1. Less than 500 2. 500-999 3. 1000-1499 4. 1500-1999 5. 2000-2499 6. 2500-2999 7. 3000-3499 8. 3500-3999 9. 4000 and above 10. I don't know
109	If you are not employed where do you get your earnings	1. from partner (husband) 2. relatives including children 3. supported by NGO 4. other----------
110	Did your husband or partner ever attended school	1. yes 2. no → 113
111	Does your husband or partner can read and write	1. no 2. read only 3. read and write
112	What is the highest grade your husband or partner completed	1. grade------ 2. Technical-and vocational certificate 3. University or college diploma 4. University or

		college degree and above
113	What is your husband occupation(what kind of work does he manly do)	1. Unemployed 2. Student 3. Daly laborer 4. Housemaid 5. House wife 6. Civil services 7. Employed at private sector 8. Merchant 9. Other----------
114	If you get your earning from your husband how much do you get per month	1. Less than 500 2. 500-999 3. 1000-1499 4. 1500-1999 5. 2000-2499 6. 2500-2999 7. 3000-3499 8. 3500-3999 9. 4000 and above 10. I don't know
115	How much is the income for the whole family in a month	1. Less than 500 2. 500-999 3. 1000-1499 4. 1500-1999 5. 2000-2499 6. 2500-2999 7. 3000-3499 8. 3500-3999 9. 4000 and above 10. I don't know

Information on pregnancy and menstruation

201	**At what age did you see your menarche**	**1. Age----------** **2. Don't remember**
202	**How was the regularity of your menstruation before this pregnancy**	**1. Regular** **2. Irregular** **3. Don't remember**
203	**How was the amount of your menstruation flow**	**1. Very heavy** **2. Heavy** **3. Moderate** **4. Low** **5. Don't remember**
204	**How was the duration of your menstruation flow (in days)**	**1. --------days** **2. Don't remember**
205	**When did your last menstruation period start**	**1. ----------** **2. Don't remember**
206	**How many times have you been pregnant including this pregnancy in your life time**	**1. ----------times** **2. Never been pregnant →216**
207	**If you had pregnancy other than this what was the interval between the pregnancies in month or years**	**1. I didn't have privies pregnancy** **2. From 1st to 2nd ----------** **3. From 2nd to 3rd ----------** **4. From 3rd to 4th ----------** **5. From 4th to 5th ----------** **6. From 5th to 6th ----------** **7. If more pregnancy----------**
208	**Did you have wanted or unwanted abortion**	**1. Yes** **2. No** **3. Don't remember**

209	**If your answer is yes how many abortion**	**1. ----------** **2. None**
210	**If your answer is yes how many miscarriage**	**1. ---------** **2. None**
211	**How many still birth did you have**	**1. ----------** **2. None**
212	**Did you have twins pregnancy in the past**	**1. ----------** **2. None**
213	**How many live birth did you have in your life time**	**1. --------** **2. None**
214	**Do you have children who was born alive and later died**	**1. ----------** **2. None**
215	**How many of your children are living with you now**	**1. ----------** **2. None**
216	**Is this pregnancy a twins pregnancy**	**1. Yes** **2. No** **3. I don't know**
217	**How many children who are under your care are live with you**	**1. ----------** **2. None**
18	**How many people live in your house**	**1. ----------** **2. None**

Information on Dietary Habit

301	**How is your main meal frequency in a day**	**1. one times** **2. two times** **3. three times** **4. I don't remember**
302	**How frequent do you take additional solid or liquid foods aside from the main foods**	**1. I don't take** **2. One times** **3. Two times** **4. Three times and more** **5. Other---------**
303	**How frequent do you take any food made**	**1. I don't take**

	from Teff like injera, kita or porridge either separately or in combination with other foods	**2. Daily** **3. From one to two times in a week** **4. Three times a week and more** **5. Ones in two weeks** **6. Other ----------**
304	**How frequent do you take any white potatoes, white yams, bulla, kocho, cassava, either separately or in combination with other food**	**1. I don't take** **2. Daily** **3. From one to two times in a week** **4. Three times a week and more** **5. Ones in two weeks** **6. Other ----------**
305	**How frequent do you take dark green leafy vegetables like kale, spinach or amaranth leaves either separately or in combination with other food**	**1. I don't take** **2. Daily** **3. From one to two times in a week** **4. Three times a week and more** **5. Ones in two weeks** **6. Other ----------**
306	**How frequent do you take any other fruit or vegetable like banana, orange, tomato, either separately or in combination with other food**	**1. I don't take** **2. Daily** **3. From one to two times in a week** **4. Three times a week and more** **5. Ones in two weeks** **6. Other ----------**
307	**How frequent do you take any liver , kidney, heart or other organ meats either separately or in combination with other food**	**1. I don't take** **2. Daily** **3. From one to two times in a week** **4. Three times a week**

		and more 5. Ones in two weeks 6. Other ----------
308	How frequent do you take any beef, lamb, goat, packed meat, fish and egg either separately or in combination with other food	1. I don't take 2. Daily 3. From one to two times in a week 4. Three times a week and more 5. Ones in two weeks 6. Other ----------
309	How frequent do you take any food made from beans, peas, lentils, or pulsed, peanuts, sesame, or sunflower seeds either separately or in combination with other food	1. I don't take 2. Daily 3. From one to two times in a week 4. Three times a week and more 5. Ones in two weeks 6. Other ----------
310	How frequent do you take Any cheese, yogurt, milk or other milk product either separately or in combination with other food	1. I don't take 2. Daily 3. From one to two times in a week 4. Three times a week and more 5. Ones in two weeks 6. Other ----------
311	How frequent do you take tea or coffee	1. I don't take 2. Daily 3. From one to two times in a week 4. Three times a week and more 5. Ones in two weeks 6. Other ----------
312	How is your eating condition in this	1. Decreased

	pregnancy in comparison with before this pregnancy	**2. No change** **3. Increased** **4. I don't know**
313	**If the condition of your eating has increased on this pregnancy what do you think the reason is**	**1. The fetus take part of the food and energy** **2. The fetus needs for growing** **3. For the health of myself and the fetus** **4. I don't know**

Information on Health condition and medication

401	**During the past six months have you had any accidental injury which lead to a heavy bleeding**	**1. Yes** **2. No** **3. I don't remember**
402	**During the past one year have you had gastritis or other duodenal ulcer**	**1. Yes** **2. No** **3. I don't remember**
403	**If your answer is yes were you told by your doctor that it had caused an internal bleeding**	**1. Yes** **2. No** **3. I don't remember**
404	**During the past one year have you taken frequently pain reliving medication or anti inflammatory drugs**	**1. Yes** **2. No** **3. I don't remember**
405	**During the past one year have you had frequently illnesses which caused diarrheas**	**1. Yes** **2. No** **3. I don't remember**
406	**During the past one year have you had illnesses caused by intestinal parasite worms**	**1. Yes** **2. No** **3. I don't remember**
407	**Have you been tested for HIV**	**1. Yes**

		2. No 3. I don't remember
408	If your answer is yes what was the result	1. Positive 2. Negative 3. No answer
409	If you are HIV positive are you taking ART Drugs	1. Yes 2. No 3. No answer
410	During the past six months have you had tuberculosis or are you on anti TB drugs	1. Yes 2. No 3. I don't know
411	During the past six months have you had a malaria infection	1. Yes 2. No 3. I don't know
412	During the past one year or now have you had a chronic kidney disease	1. Yes 2. No 3. I don't know
413	Were you told by your doctor that you had a cancer disease	1. Yes 2. No 3. I don't know
414	Were you told by your doctor that you have a bleeding disorder like hemophilia	1. Yes 2. No 3. I don't know
415	During the past one year or now have you had any kind of chronic disease	1. Yes 2. No 3. I don't know
416	If your answer is yes please mention it	1. ----------
417	During the past one year or now have you had hemorrhoids	1. Yes 2. No 3. I don't know
418	During the past one year or now have you had a gum bleeding	1. Yes 2. No 3. I don't know
419	Did you take or are you taking any drugs given for anemia during this pregnancy	1. Yes 2. No 3. I don't know

420	**If your answer is yes for how long**	**1. ---------** **2. I don't remember**
421	**Have you heard about anemia**	**1. Yes** **2. No** **3. I don't know**
422	**Can you tell me some food which are rich with Iron and helps to protect anemia**	**1. Teff** **2. Wheat** **3. Beryl** **4. Green leafy vegetable** **5. Other yellow fruit** **6. Other green vegetable** **7. Fish** **8. Meat** **9. Egg** **10. Milk** **11. Other fruits** **12. Other specify** **13. I don't know**
423	**Laboratory result of hemoglobin or hematocrit**	**1.Hemoglobin 1st result ------date-----** **Last result-------** **date-----** **2.heamatocrit 1st result------date----** **Last result------date----**

Annex IV የፍቃደኝነት መጠየቂያ ቅጽ

በአዲስ ኮንትኔንታል የህበረተሰብ ጤና አጠባበቅ ኢንስትቲዩት በአዲስ አበባ ከተማ የሚኖሩ የነፍሰጡር ሴቶች ላይ የሚከሰተውን የደም ማነስ ችግር ለማጥናት የተዘጋጀ የግለሰቦች የፍቃደኝነት መጠየቂያ ፎርም፡፡

ስሜ ---------- ይባላል፡፡ እኔ ከአዲስ ኮንቲንታል ኢንስቲቲዩት የጥናት ቡድን ጋር አብሬ እየሰራሁ ነው፡፡ አሁን በ ---------- ጤና ጣቢያ የነፍሰጡር ሴቶች ተከታታይ ህክምና ክፍል ውስጥ በእርግዝና ወቅት የሚከሰቱ ከደም ማነስ ጋር ተያያዥነት ያላቸውን ሆኔታዎች ለማጥናት ቃለ መጠይቅ እያደረኩ ነው፡፡

በእርግዝና ወቀት የሚከሰት የደም ማነስ ችግር በዋናነት ከሚጠቀሱት የሕብረተሰብ የጤና ችግሮች አንዱ ሲሆን በተለይ በዚሁ ምክንያት ለሚከሰቱ የእናቶች ሞትና መታመም እንዲሁም ከወሊድ ጋር የተያያዙ የህፃናት የጤና ችግር ጉልህ አስተዋፅኣ አለው፡፡ በዚህ መጠይቅ ላይ የእርስዎ ተሳትፎ ከላይ የተጠቀሱ|ትን ችግሮች ለማስወገድ ለሚደረገው ጥናት ጉልህ አስተዋፅኦ ይኖረዋል፡፡

ስምዎ በዚህ መጠየቅ ውስጥ የማይጠቀስ መሆኑንና በቃለ መጠየቁ የሚሰጡን መረጃ ሁሉ በሚስጥር ተይዞ ለጥናቱ አገልግሎት ብቻ የሚውል መሆኑን ላረጋግጥልዎ እወዳለሁ፡፡ እርስዎ በዚህ ጥናት ላይ የመሳፉፍ ያለመሳተፍ ወይም በማንኛውም ወቅት ቃለመጠይቁን የማቋረጥ ሙሉ መብት አልዎት፡፡

- ግልፅ ያልሆነሎት ነገር ካለ ይጠይቁኝ፡፡
- በጥናቱ ላይ ለመሣተፍ ፍቀደኛኖት?

ሀ) አዎን ለ) አይደለሁም

መልሱ አዎን ከሆነ አመሰግነው ቃለ መጠየቁን ይጀምሩ፡፡

መልሱ ፍቃደኛ አይደለሁም ከሆነ ወደ ሚቀጥለው ተጠያቂ ይለፉ፡፡

የቃለ መጠይቁ የተደረገበት ቀን _____ወር_____ዓ.ም__

Annex V የቃለመጠይቅ ቅጽ

መረጃ ስራ ማህበራዊ ሁኔታ

ተ.ቁ	ጥያቄዎች	መልስ ሊሆኑ የሚችሉ ዝርዝሮች	ይለፉ
101	ዕድሚዎት ስንት ነው? (በሙሉ ዓመታት ይገለፅ)	---------	
102	የጋብቻ ሁኔታዎች ምን ይመስላል?	1. በፍፅም አላገባሁም 2. አግብቻለሁ ወይም ከባለቤቴ ጋር አብሬ እኖራለሁ 3. ተለያይቻለሁ 4. ተፋትቻለሁ 4. የትዳር አጋሬ ሞቶብኛል፡፡ 5. ሌላ ካለ ይገለጽ-------	
103	ሀይማኖትዎ ምንድን ነው?	1. ኦርቶዶክስ 2. ካቶሊክ 3. ፕሮቴስታንት 4. ሙስሊም 5. የባህል 6. ሌላ ካለ ይግለፁ----------	
104	መደበኛ ትምህርት ተከታትለው ያውቃሉ	1.አዎን 2.የለም →	107
105	ማንበብ መፃፍ ይችላሉ	1. የለም 2. ማንበብ ብቻ 3. ማንበብና መፃፍ	
106	ያጠናቀቁት ከፍተኛ ክፍል ስንት ነው	1.ክፍል -------2. ቴክኒክና ሙያ ሰርተፊኬት 3.ዩኒቨርስቲ/ ኮሌጅ ዲፕሎማ 4.ዩኒቨርስቲ/ ኮሌጅ/ድግሪ ወይም ከዚያ በላይ	
107	ሥራዎት ምንደን ነው ማለቴ ምን አይነት ሥራ ነው በዋነኝነት የሚሠሩት ?	1.ሥራ አልሠራም 6. ገበሬ ነኝ 2.ተማሪ ነኝ 7. የመንግስት ሠራተኛ ነኝ 3.የቀን ሠራተኛ ነኝ 8. የግል መስሪያ ቤት ተቀጣሪ ነኝ 4.የቤት ሠራተኛ ነኝ 9. ነጋዴ ነኝ 5.የቤት እመቤት ነኝ 10. ሌላ ካለ ይግለጹ	
108	ስራ የሚሠሩ ከሆነ የወር ደመወዝዎት ምን የህል ነው፡፡	1. ከ500 መቶ ያነሰ 6. ከ2500 እስከ 2999 2. ከ500 እስከ 999 7. ከ3000 እስከ 3499 3.ከ1000 እስከ 1499 8. 3500 እስከ 4000 4. ከ1500 እስከ 2000 9.4000 እና ከ4000በላይ 5.ከ2000 እስከ 2499 10. አላውቀውም	
109	ስራ ተቀጣሪ ካልሆኑ ለኑሮዎት አስፈላጊ የሆነውን ገንዘብ ከየት ያገኛሉ፡፡	1. ከትዳር ጋደኛዬ 2. ከዘመዶቼ ልጆቼንም ጨምሮ 3. ከእርዳታ ድርጅት 4. ሌላ ካለ ይግለጹ----------	

110	የትዳር ጓደኛዎት መደበኛ ትምህርት ተምረው ያውቀሉ?	1.አዎን 2.የለም →	113
111	የትዳር ጓደኛዎት ማንበብ መፃፍ ይችላሉ	1. የለም 2. ማንበብ ብቻ 3. ማንበብና መፃፍ	
112	የትዳር ጓደኛዎት ያጠናቀቁት ከፍተኛ ክፍል ስንት ነው	1.ክፍል -------2. ቴክኒክና ሙያ ሰርተፊኬት 3.ዩኒቨርስቲ/ ኮሌጅ ዲፕሎማ 4.ዩኒቨርስቲ/ ኮሌጅ/ድግሪ ወይም ከዚያ በላይ	
113	የባለቤትዎ ሥራ ምንደን ነው ማለቱ ምን አይነት ሥራ ነው በዋነኝነት የሚሠሩት ?	1.ሥራ አይሠራም 6. ገበሬ ነው 2.ተማሪ ኑው 7. የግል ድርጅት ተቀጣሪ ነው 3.የቀን ሠራተኛ ነው 8. ነጋዴ ነው 4.የመንግስት ሠራተኛ ነው 9. ሌላ ካለ ይገለጽ---- 5.የጥበቃ ሠራተኝ ነው	
114	ከትዳር ጎደኛዎት እየተረዱ ከሆነ የሚኖሩት በወር ምን ያህል ያገኛሉ?	1. ከ500 መቶ ያነሰ 6. ከ2500 እስከ 2999 2. ከ500 እስከ 999 7. ከ3000 እስከ 3499 3.ከ1000 እስከ 1499 8. 3500 እስከ 4000 4. ከ1500 እስከ 2000 9.4000 እና ከ4000በላይ 5.ከ2000 እስከ 2499 10. አላውቀውም	
115	በአጠቃላይ የሁሉም ቤተሰቡ የወር ገቢ ምን ያህል ነው?	1. ከ500 መቶ ያነሰ 6. ከ2500 እስከ 2999 2. ከ500 እስከ 999 7. ከ3000 እስከ 3499 3.ከ1000 እስከ 1499 8. 3500 እስከ 4000 4. ከ1500 እስከ 2000 9.4000 እና ከ4000በላይ 5.ከ2000 እስከ 2499 10. አላውቀውም	
<u>መረጃ እርግዝናንና የወር አበባን በተመለከተ</u>			
201	የወር አበባ ማየት የጀመሩት በስንት አመትዎ ነው?	1. ------- 2. አላስተውሰውም	
202	ከእዚህ እርግዝናዎት በፊት የወር አበባዎት አመጣጥ እንዴት ነበር	1. በትክክል ይመጣ ነበር 2. በትክክል አይመጣም ነበር (ያዛባ ነበር) 3. አላስታውስም	
203	የወር አበባዎት አፈሳሰስ እንዴት ነበር ?	1. በጣም ከባድ ነበር 2. ከባድ ነበር 3. በመጠኑ ነበር 4. ትንሽ ነበር 5. አላስታውስም	
204	የወር አበባዎት መጥቶ እስከሚሄድ ምን ያህል ቀን ይፈጃል	1.---- 2. አላስታውስም	
205	የመጨረሻ የወር አበባዎ የመጣበት ቀን መቼ ነው	1.---- 2. አላስታውስም	

206	በሕይወትዎ ውስጥ ይህንን እርግዝና ጨምሮ ምን ያህል ጊዜ አርግዘዋል	1. ----- ጊዜ አርግፏለሁ 2. መልስ የለም	
207	ከዝህ ሌላ እርግዝና ከነበረዎት በእያንዳንዱ እርግዝናዎች ያለው ርቀት በወራት ወይም በዓመታት ምን ያህል ነበር	1. ከ1ኛው እስከ 2ኛው ----- 2. ከ2ኛው እስከ 3ኛው ----- 3. ከ3ኛው እስከ 4ኛው ----- 4. ከ4ኛው እስከ 5ኛው----- 5. ከ5ኛ እስከ 6ኛው ----- 6. ከዚያም በላይ ካለ ይገለጽ ------	
208	ከዚህ በፊት ፈልገውም ይሁን ሳይፈልጉ ውርጃ አጋጥሞት ያውቃል?	1. አዎ 2. የለም → 216 3. መልስ የለም	
209	መልስዎት አዎን ከሆነ ምን ያህል ውርጃ አለዎት? በቁጥር ይግለጹ	1. ---- 2. መልስ የለም	
210	ምን ያህል የፅንስ መጨንገፍ አጋጥሞታል በቁጥር ይግለጹ?	1. ---------- 2.መልስ የለም	
211	ምን ያህል በወሊድ ወቅት የሞተ ልጅ አለዎት?	1------ 2.መልስ የለም	
212	ባለፉት ጊዜያት የመንታ እርግዝና ነበርዎት? ካለ በቁጥር	1. ------- 2. መልስ የለም	
213	በህይወት የተወለዱ ልጆች ምን ያህል ናቸው፡፡	1. በቁጥር ይግለፅ----- 3. መልስ የለም 2. የለኝም	
214	በህይወት ከተወለደ በኋላ የሞተ ልጅ አለዎት?	1. አዎን 2.የለም 3. መልስ የለም	
215	በአሁኑ ጊዜ ከእርስዎ ጋር የሚኖሩ ልጆችዎት ስንት ናቸው	1. ------ 2. መልስ የለም	
216	ይህ እርግዝና መንታ ነው ወይ?	1. አዎን 2. አይደለም 3. አላውቅም	
217	በአሁኑ ጊዜ እርስዎ የሚንከባከቧቸው ራሳቸውን ያልቻሉ ልጆች ስንት ናቸው ?	1.በቁጥር ይገለፅ__ 2. የሉኝም 3. መልስ የለም	
218	በመኖሪያ ቤትዎ ውስጥ በአጠቃላይ ምን ያህል ሰዎች ይኖራሉ?	1. በቁጥር ይገለፅ_____ 2 .መልስ የለም	
<u>መረጃ አመጋገብን በተመለከተ</u>			
301	በዋንኝነት በቀን ምን የህል ግዜ ይመገባሉ?	1. አንድ ግዜ 3. ሶስት ጊዜ 2. ሁለት ጊዜ 4. አላስታውስም	
302	ሌላ ተጨማሪ ምግቦች ወይም ፈሳሽ	1. አመጋገቡ	

	የሆኑ ምግቦች ከዋና ምግቦች መካከል አጠቃቀምዎ እንዴት ነው?	2. በቀን አንድ ጊዜ 3. በቀን ሁለት ጊዜ 4.በቀን ሦስት ጊዜና ከዛም በላይ 5. ሌላ ካለ ይገለጽ_____	
303	የጤፍ እንጀራ ቂጣ ወይም የጤፍ ገንፎ ለብቻቸውም ሆነ ከሌላ ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
304	ድንጽ ቡላ ቆሮ ፣ጎደሬ ፣ቦዬ ፣ ከሥራ ሥር የተሠሩ ምግቦች ለብቻቸውም ሆነ ከሌላ ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
305	ከማንኛውም አረንጓዴ ቅጠላ ቅጠል አትክልቶች የተዘጋጀ ምግብ (እንደጎመን ቆስጣ የመሳሰሉት) ለብቻቸውም ሆነ ከሌላ ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
306	ሌሎች ፍራፍሬዎች ወይም አትክልቶች (እንደ ሙዝ ብርቱካን ቲማቲም የመሳሰሉት) ለብቻቸውም ሆነ ከሌላ ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
307	ጉበት ፣ኩላሊት፣ልብ፣ ወይም የሌላ የብልት ሥጋ ፣ የበግ ሥጋ፣ የፍየል ሥጋ ፣የዶሮ ሥጋ፣ የታሸጉ ሥጋዎች እንዲሁም አሣ ለብቻቸውም ሆነ ከሌላ ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
308	ከአትር ከባቄላ ከምሥር ወይም ከሌሎች ጥራጥሬዎች የተሠሩ ምግቦችን ለብቻቸውም ሆነ ከሌላ	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ	

	ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
309	አይብ፣ እርጎ፣ ወተት፣ ወይም የወተት ውጤቶችን ለብቻቸውም ሆነ ከሌላ ምግብ ጋር ተደባልቆ የተዘጋጁ ምግቦች አመጋገብዎ እንዴት ነው?	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
310	ሻይ ወይም ቡና አጠጣጥዎ እንዲት ነው	1. አልጠቀምም 2. በየቀኑ 3. በሣምንት ከአንድ እስከ ሁለት ጊዜ 3. በሣምንት 3 ጊዜ እና ከዚያ በላይ 4. በ15 ቀን አንድ ጊዜ 5. ሌላ ካለ ይገለፅ_____	
311	አሁን በእርግዝና ወቅት አመጋገብዎ ከሌላ ጊዜው ሲወዳደር እንዴት ነው	1. ከወትሮ ቀንሷል 2. ለውጥ የለውም ⟶ 3. ከወትሮ ጨምሯል 4. አላውቀውም	401
312	በእርግዝና ወቅት አመጋገብዎ ጨምሮ ከሆነ ምክንያቱ ምንድን ነበር	1. ፅንሱ ምግብና ሐይል ስለሚሻማ 2. ጽንሱ እድገት ስለሚያስፈልገው 3. ለጽንሱና ለራሴ ጤንነት 4. አላውቀውም	
<u>መረጃ ስለተለያዩ የጤና ሁኔታዎች እና መድሀኒቶችን በተመለከተ</u>			
401	በአለፉት 6 ወራት ውስጥ በጣም ደም ያስደማ አደጋ አጋጥሞዎት ነበር	1. አዎን 2.የለም 3. አላስታውስም	
402	ባለፈው 1 ዓመት ውስጥ ወይም አሁን የጨጓራ ሕመም ችግር አለብዎት?	1. አዎን 2. የለም 3. አላስታውስም	
403	መልስዎት አዎን ከሆነ በህክምና ወቅተ ሀኪምዎች ከውስጥ የመድማት ችግር ከጨጓራ ወይንም ከትንሹ አንጀት እንዳስከተከለብዎት ተነግሮዎትያውቃል?	1. አዎን 2.የለም 3. አላስታውስም	
404	ባለፈው 1 ዓመት ውስጥ ወይም አሁን የህመም ማስታገሻ እና ለቁርጥማት መድሃኒቶች አዘውትረው ወስድው የውቃሉ?	1. አዎን 2. የለም 3.አላስታውስም	
405	በየግዜው እየተመላለሱ የሚያስችግር የተቅማጥ ችግር ነበረብዎት?	1. አዎን 2. የለም 3. አላስታውስም	

406	ጥገኛ የአንጅት ትላትሎች ችግር ባለፈው ስድስት ወር ውስጥ ኖሮብዎት ያውቃል?	1. አዎን 2. የለም 3. አላስታውስም	
407	የኤች አይ ቪ ኤድስ መርመራ አርገው ያውቃሉ?	1. አዎን 2.አላውቅም 3. መልስ የለም	
408	መልስዎት አዎን ከሆነ ውጤቱ ምን ነበር?	1. ቫይረሱ በደሜ ውስጥ አለ 2. ቫይረሱ በደሜ ውስጥ የለም 3.መልስ የለም	
409	ቫይረሱ በደምዎ ውስጥ ከተገኘ የፀረ ኤች አይ ቪ መድሃኒት ተጠቃሚ ነዎት	1. አዎን 2.አይደለም 3. መልስ የለም	
410	ባለፉት 6 ወራት ውስጥ የሳንባ ነቀርሳ በሽታ ኖሮዎት ያውቃል? ወይም የሳንባ ነቀርሳ መድሃኒት እየወሠዱ ነው?	3.አዎን 2. አላውቅም 3. አላስታውስም	
411	ባለፉት 6 ወራት ውስጥ የወባ በሽታ ተጠቅተው ያውቃሉ?	1. አዎን 2. አላውቅም 3. አላስታውስም	
412	ባለፈው 1 ዓመት ውስጥ ወይም አሁን የተደጋገመ የኩላሊት በሽታ ነበረብዎት ወይንም በአሁኑ ወቅት አለብዎት	1.አዎን 2.የለብኝም 3.አላስታውስም	
413	ማንኛውም አይነት የካንሠር ችግር እንዳለብዎት በሀኪም ተነግሮዎት ያውቃሉ?	1.አዎን 2.አያውቅም 3.አላስታውስም	
414	በሀኪምዎት የደምዎት አይነት ከጤነኛ ሰው የተለየ በቀላሉ ብዙ የመድማትና በዙ ደም የመፍሰስ ችግር እንዳለብዎት ወይንም የደም ካንሰር እንዳለብዎት ተነግርዎት ያውቅል?	1. አዎን 2. አያውቅም 3.አላስታውስም	
415	ባለፈው 1 ዓመት ማንኛውም አይነት የቆየና ክትትል የሚያስፈልገው የጤና ችግር እንዳለበዎት ተነግሮዎት ያውቃል? ወይም በአሁኑ ወቅት አለብዎት?	1. አዎን 2.አያውቅም 3. አላስታውስም	
416	መልስዎት አዎን ከሆነ እባክዎት ቢገልፁልን	----------	
417	ባለፈው 1 ዓመት ውስጥ የኪንታሮት ችግር (በሽታ) በፊንጢጣ ውስጥም ሆነ ውጨ ነበረብዎት ወይንም አሁንም አለብዎት	1.አዎን 2.የለብኝም 3.አላስታውስም	
418	ባለፈው 1 ዓመት ውስጥ የድድ መድማት	1. አዎን 2. የለብኝም 3. አላስታውስም	

	ችግር ነበረብዎት ወይም አሁን አለብዎት		
419	በእርግዝናዎ ወቅት መወሠድ ያለበት የደም ማነስ መከላከያ መድሃኒት እየወሠዱ ነው?	1. አዎን 2.አይደለም 3.አላውቅም	
420	መልስዎት አዎን ከሆነ ለምን ያህል ጊዜ	1. ጌዜው ይገለጽ ---------- 2. አላስታውሰውም	
421	ስለ ደም ማነስ በሽታ የተወሰሠነ ዕውቀት አለዎት?	1. አዎን 2. የለኝም 3. አላውቅም	
422	የብረት መአድን (አይረን) የበለፀጉ ደም ማነስ ለማከላከል የሚረዱ የምግብ አይነቶች ሊነግሩኝ ይችላሉ? (በማወጣጣት ይጠይቁና ከምርጫው ያክብቡ)	1. ጤፍ 2. ስንዴ 3 ገብስ 4. ቅጠላማ አትክልቶች 5. ብርቱካናማ ቅጠል ያላቸው ፍራፍሬዎችና አትክልቶች 6. ሌሎች አትክልቶች 7. አሣ 8ሥጋ 9.እንቁላል 10. ወተት 11. ሌሎች ፍራፍሬዎች 12. ሌሎች (ይገለጽ----------) 13. አይታወቅም	
423	በምርመራ የተገኘው የሂሞግሎቢን ወይንም የሂማቶክሪት መጠን	1. የሂሞግሎቢን መጠን ---- የመጀመሪያው ☐ ---------- የመጨረሻው ☐ ---------- 2. የሂማቶክሪት መጠን ------- የመጀመያው ☐ ---------- የመጨረሻው ☐ ----------	